

CLAIMS

What is claimed is:

1. A method of automating the provisioning of network services for customer premises equipment of a subscriber in a next generation digital telecommunications network, the method comprising the steps of:
receiving a service request from a network service provider that specifies a service to be provided to the customer premises equipment;
retrieving a configuration template for a configuration appropriate for the customer premises equipment;
allocating and reserving at least one resource associated with the customer premises equipment;
generating configuration data for the customer premises equipment based on the configuration template and stored system configuration information;
delivering the configuration data over the network to the customer premises equipment to result in provisioning the customer premises equipment to provide the service.
2. A method as recited in Claim 1, wherein the customer premises equipment is an ADSL router, wherein the network is an asynchronous transfer mode (ATM) network, and wherein the step of generating configuration data includes the step of allocating and reserving an IP address and fully-qualified domain name for each of a plurality of permanent virtual circuits associated with communications among the network and the router.
3. A method as recited in Claim 1, wherein the configuration service request comprises information uniquely identifying the customer premises equipment, information identifying one or more permanent virtual circuits assigned by the service provider to the customer premises equipment; and access control data.

4. A method as recited in Claim 1, wherein the customer premises equipment is an ADSL router, wherein the network is an asynchronous transfer mode (ATM) network, and wherein the step of delivering the configuration data comprises the steps of storing the configuration data in a file server that is communicatively coupled to the network and delivering the configuration data from the file server to the ADSL router using file transfer protocol.

5. A method as recited in Claim 1, wherein the customer premises equipment is an T1 CPE device, wherein the network is an asynchronous transfer mode (ATM) network, and wherein the step of delivering the configuration data comprises the steps of pre-staging the configuration data in a file server that is communicatively coupled to the network and delivering the configuration data from the file server to the T1 CPE device using telnet.

6. A method as recited in Claim 1, wherein the step of generating configuration data includes the steps of:
 allocating and reserving one or more network addresses respectively associated with one or more communication channels between the network and the customer premises equipment by communicating with a dynamic host control protocol (DHCP) server;
 allocating and reserving one or more fully qualified domain names respectively associated with one or more communication channels between the network and the customer premises equipment by communicating with a domain name service (DNS) server.

7. A method as recited in Claim 1, further comprising the steps of:
 creating and storing updated configuration data in response to receiving a request to update provisioning of the customer premises equipment;
 generating a request to a proxy element of a network access device to update the provisioning to the customer premises equipment.

1 8. A method as recited in Claim 1, further comprising the steps of:
2 creating and storing updated configuration data in response to receiving a request to
3 update provisioning of the customer premises equipment;
4 delivering the updated configuration data to the customer premises equipment;
5 applying the updated configuration data as a merge to an existing configuration of the
6 customer premises equipment, to result in creating a merged configuration;
7 saving the merged configuration as a start-up configuration for the customer premises
8 equipment.

1 9. A method as recited in Claim 1, further comprising the steps of:
2 receiving information indicating that access is provisioned for a subscriber associated
3 with the customer premises equipment and that one or more permanent virtual
4 circuits are established in network elements of the network for facilitating the
5 access;
6 allocating and reserving network addresses for a voice signaling channel and a bearer
7 channel associated with communications between the customer premises
8 equipment and the network;
9 updating a domain name service server with information that associates the allocated
10 and reserved network addresses with the customer premises equipment;
11 creating and storing one or more mappings for the permanent virtual circuits in a
12 switch device that directs network communications to the customer premises
13 equipment.

1 10. A method as recited in Claim 1, further comprising the steps of:
2 retrieving system configuration data from one or more sub-networks that contain the
3 customer premises equipment;
4 allocating network addresses for a signaling channel and a bearer channel associated
5 with the customer premises equipment;
6 updating a DNS server with mappings of the network addresses and corresponding
7 fully-qualified domain names.

1 11. A method as recited in Claim 1, wherein the steps of retrieving a configuration
2 template for a configuration appropriate for the customer premises equipment include
3 the steps of:
4 extracting a device type and service type from the service request;
5 searching a template registry table for the template based on the device type and
6 service type;
7 if a template associated with the device type and service type is not found in the
8 template registry table, selecting and using a default configuration template.

1 12. A computer-readable medium carrying one or more sequences of instructions for
2 automatically provisioning network service for customer premises equipment of a
3 subscriber in a next generation digital telecommunications network, which
4 instructions, when executed by one or more processors, cause the one or more
5 processors to carry out the steps of:
6 receiving a service request from a network service provider that specifies a service to
7 be provided to the customer premises equipment;
8 retrieving a configuration template for a configuration appropriate for the customer
9 premises equipment;
10 allocating and reserving at least one resource associated with the customer premises
11 equipment;
12 generating configuration data for the customer premises equipment based on the
13 configuration template and stored system configuration information;
14 delivering the configuration data over the network to the customer premises
15 equipment to result in provisioning the customer premises equipment to
16 provide the service.
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1 13. An apparatus for automatically provisioning network service for customer premises
2 equipment of a subscriber in a next generation digital telecommunications network,
3 comprising:
4 means for receiving a service request from a network service provider that specifies a
5 service to be provided to the customer premises equipment;
6 means for retrieving a configuration template for a configuration appropriate for the
7 customer premises equipment;
8 means for allocating and reserving at least one resource associated with the customer
9 premises equipment;
10 means for generating configuration data for the customer premises equipment based
11 on the configuration template and stored system configuration information;
12 means for delivering the configuration data over the network to the customer premises
13 equipment to result in provisioning the customer premises equipment to
14 provide the service.

1 14. An apparatus for automatically provisioning network service for customer premises
2 equipment of a subscriber in a next generation digital telecommunications network,
3 comprising:
4 a processor;
5 a network interface communicatively coupled between the processor and the network
6 and configured to communicate data among the processor and the network;
7 a computer-readable medium comprising one or more sequences of instructions
8 which, when executed by the processor, cause the processor to carry out the
9 steps of:
10 receiving a service request from a network service provider that specifies a
11 service to be provided to the customer premises equipment;
12 retrieving a configuration template for a configuration appropriate for the
13 customer premises equipment;
14 allocating and reserving at least one resource associated with the customer
15 premises equipment;

16 generating configuration data for the customer premises equipment based on
17 the configuration template and stored system configuration
18 information;
19 delivering the configuration data over the network to the customer premises
20 equipment to result in provisioning the customer premises equipment
21 to provide the service.

1 15. An apparatus for automatically provisioning network service for customer premises
2 equipment of a subscriber in a next generation digital telecommunications network,
3 comprising:
4 a provisioning engine configured to receive a service request from a network service
5 provider that specifies a service to be provided to the customer premises
6 equipment;
7 a configuration template manager communicatively coupled to the provisioning
8 engine and configured to retrieve a configuration template for a configuration
9 appropriate for the customer premises equipment;
10 means in the provisioning engine for allocating and reserving at least one resource
11 associated with the customer premises equipment and for generating
12 configuration data for the customer premises equipment based on the
13 configuration template and stored system configuration information;
14 a configuration delivery manager communicatively coupled to the provisioning
15 engine and configured to deliver the configuration data over the network to the
16 customer premises equipment to result in provisioning the customer premises
17 equipment to provide the service.

1 16. An apparatus as recited in Claim 15, further comprising a resource manager that is
2 communicatively coupled to the provisioning engine and communicatively coupled to
3 a dynamic host control protocol (DHCP) server and a domain name service (DNS)
4 server, wherein the resource manager is configured to request and receive one or more
5 network addresses from the DHCP server and to request and receive one or more
6 fully-qualified domain names from the DNS server.

- 1 17. An apparatus as recited in Claim 15, further comprising an inventory manager that is
2 communicatively coupled to the provisioning engine and to an inventory repository
3 that comprises network element inventory information, and wherein the means for
4 generating configuration data includes means for generating the configuration data
5 based on the network element inventory information.
- 1 18. An apparatus as recited in Claim 15, wherein the customer premises equipment is an
2 ADSL router, wherein the network is an asynchronous transfer mode (ATM) network,
3 and wherein means for generating configuration data includes means for allocating
4 and reserving an IP address and fully-qualified domain name for each of a plurality of
5 permanent virtual circuits associated with communications among the network and
6 the router.
- 1 19. An apparatus as recited in Claim 15, wherein the configuration service request
2 comprises information uniquely identifying the customer premises equipment,
3 information identifying one or more permanent virtual circuits assigned by the service
4 provider to the customer premises equipment; and access control data.
- 1 20. An apparatus as recited in Claim 15, wherein the customer premises equipment is an
2 ADSL router, wherein the network is an asynchronous transfer mode (ATM) network,
3 and wherein means for delivering the configuration data comprises means for storing
4 the configuration data in a file server that is communicatively coupled to the network
5 and delivering the configuration data from the file server to the ADSL router using
6 file transfer protocol.